

### Purpose of this handout:

- 1) C Syntax / Semantics
- 2) Style requirements (comments, variable naming, indentation) { placement}

### Basic C Program 1:

```
/* helloworld.c
 * purpose: Show basic C program structure and printing
 */
#include<stdio.h>
#include <stdlib.h>
```

```
int main()
{
    printf("Hello World\n");
}
```

\*\*\*\*\*

To compile the code (go from human-readable code to an executable for the computer):

The executable will be named a.out:       \$ clang helloworld.c

To run:                                     \$ ./a.out

To make an executable with the name myprogram   \$ clang helloworld -o myprogram

To run:                                     \$ ./myprogram

\*\*\*\*\*

### Basic C Program 2:

```
/* singlemaintemp.c
 * purpose: Show variable declaration, use, reading from user, printing.
 */
#include<stdio.h>
#include <stdlib.h>
```

```
int main()
{
    double fahr, celsius;   // declaration of variable named fahr to be type double
```

```
    // print out user information
    printf("This program converts from Celsius to Fahrenheit\n");
```

```
    // get user input
    printf("Enter a temperature in Celsius > ");
    scanf( "%lf", &celsius);
```

```
    // calculate the temperature
    fahr = (celsius*9.0)/5.0+32;
```

```
    // output the result
    printf("%lfC == %lfF\n", celsius, fahr);
```

```
    // return success
    return (0);
```

```
}
```

### Basic Program 3:

```
/* functiontemp.c
 * purpose: Show how to implement, use functions.
 */
#include<stdio.h>
#include <stdlib.h>
```

```
/* convert_celsius_to_fahrenheit
 * purpose: Converts a temperature given in Celsius into Fahrenheit.
 * input parameters:
 * float - the temperature in Celsius
 * return value:
 * float - the temperature in Fahrenheit
 */
```

```
float convert_celsius_to_fahrenheit(float cel)
{
    float f = (cel*9.0)/5.0+32;
    return f; // must explicitly return the calculated number
}
```

```
int main()
{
    double fahr, celsius;

    // print out user information
    printf("This program converts from Celsius to Fahrenheit\n");
```

```
    // get user input
    printf("Enter a temperature in Celsius > ");
    scanf( "%lf", &celsius);
```

```
    // calculate the temperature
    fahr = convert_celsius_to_fahrenheit(celsius);
```

```
    // output the result
    printf("%lfC == %lfF\n", celsius, fahr);
```

```
    // return success
    return (0);
```

```
}
```

\*\*\*\*\*

To compile the code (go from human-readable code to an executable for the computer):

The executable will be named a.out:       \$ clang functiontemp.c

To run:                                     \$ ./a.out

To make an executable with the name blah     \$ clang functiontemp.c -o blah

To run:                                     \$ ./blah

### Basic Program 3:

```
/* functiontemp.c
 * purpose: Illustrate variable scope and lifetime and common mistakes.
 * Note: THIS IS A BUGGY PROGRAM!!!!!!!!!! FIND THE BUGS!!!!
 */
#include<stdio.h>
#include <stdlib.h>

/* convert_celsius_to_fahrenheit
 * purpose: Converts a temperature given in Celsius into Fahrenheit.
 * input parameters:
 * float - the temperature in Celsius
 * return value:
 * float - the temperature in Fahrenheit
 */
float c_to_f(float cel)
{
    float fahr = cel * ( 9 / 5 )+32;
    printf("%lfC == %lfF\n", celsius, fahr);

}

int main()
{
    double fahr, celsius;

    // print out user information
    printf("This program converts from Celsius to Fahrenheit\n");

    // get user input
    printf("Enter a temperature in Celsius > ");
    scanf( "%lf", &celsius);

    // calculate the temperature
    fahr = c_to_f(celsius);

    // output the result
    printf("That's right - %lfC == %lfF\n", celsius, fahr);

    // return success
    return (0);
}
```